Capabilities for Enabling Seabase Logistics

(For Materiel Packaging, Handling, Transfer, and Asset Visibility Systems)

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Stephen M. Michetti,
Representing NSWC Team

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Patricia K. Dolan , By direction

NSWC Team
(Established October 2000)

Membership

- NSWCCD
- NSWCCD-SSES
- NSWCIH-PHST
- NSWCPHD – UNREP
- NSWCDD-CSS

Recognized Technical Experts for:

- Packaging/PHST
- Intraship Materiel Handling Systems
- Intership Materiel Transfer Systems
- Total Asset Visibility Systems

Experience/Background

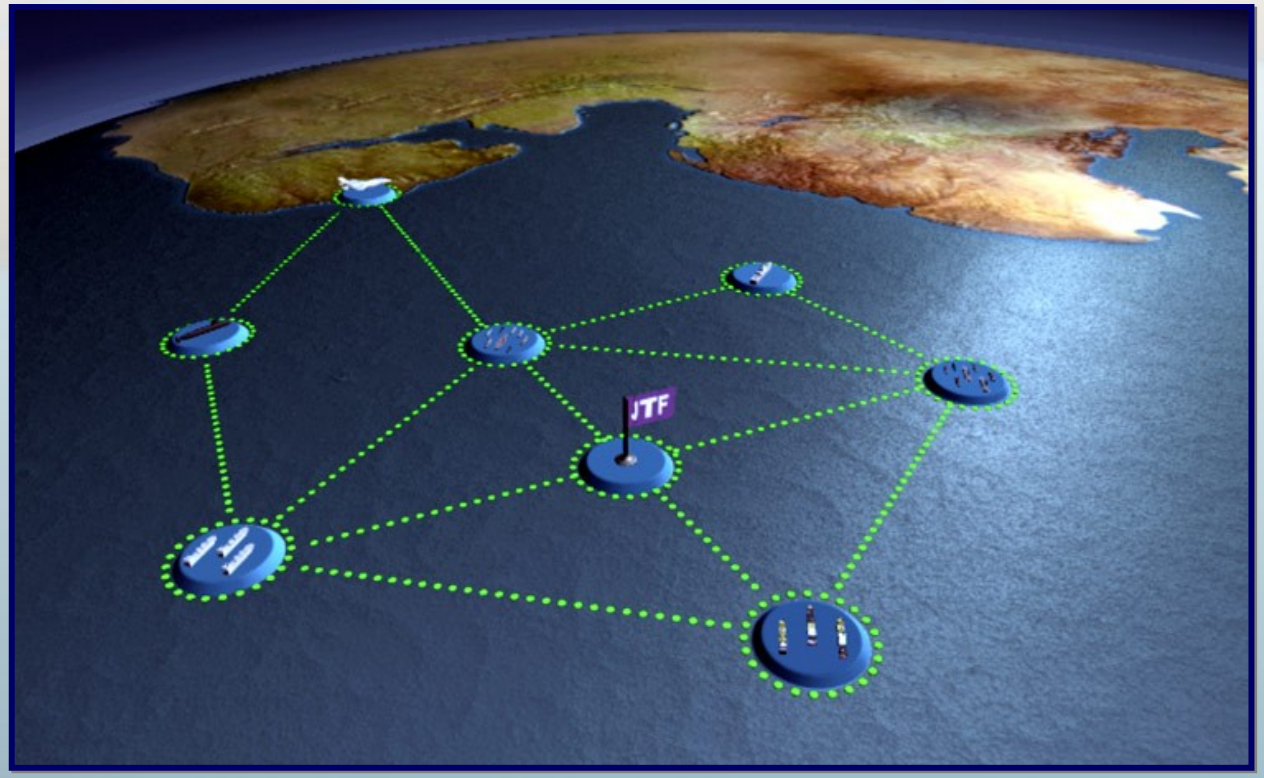
- Team Support to PMS325
- Active with Fleet/RDT&E/Engineering Initiatives
- Partnerships with Industry, Academia, Government
- Members Support SDM's/APM's for New Acquisition Programs
- Members of NavOpLog Integration Program (Integration Team)
- Participants on Related Working Groups (e.g. JILWG, AIT SG, etc)

Seabase Scenario

Seabase Capabilities

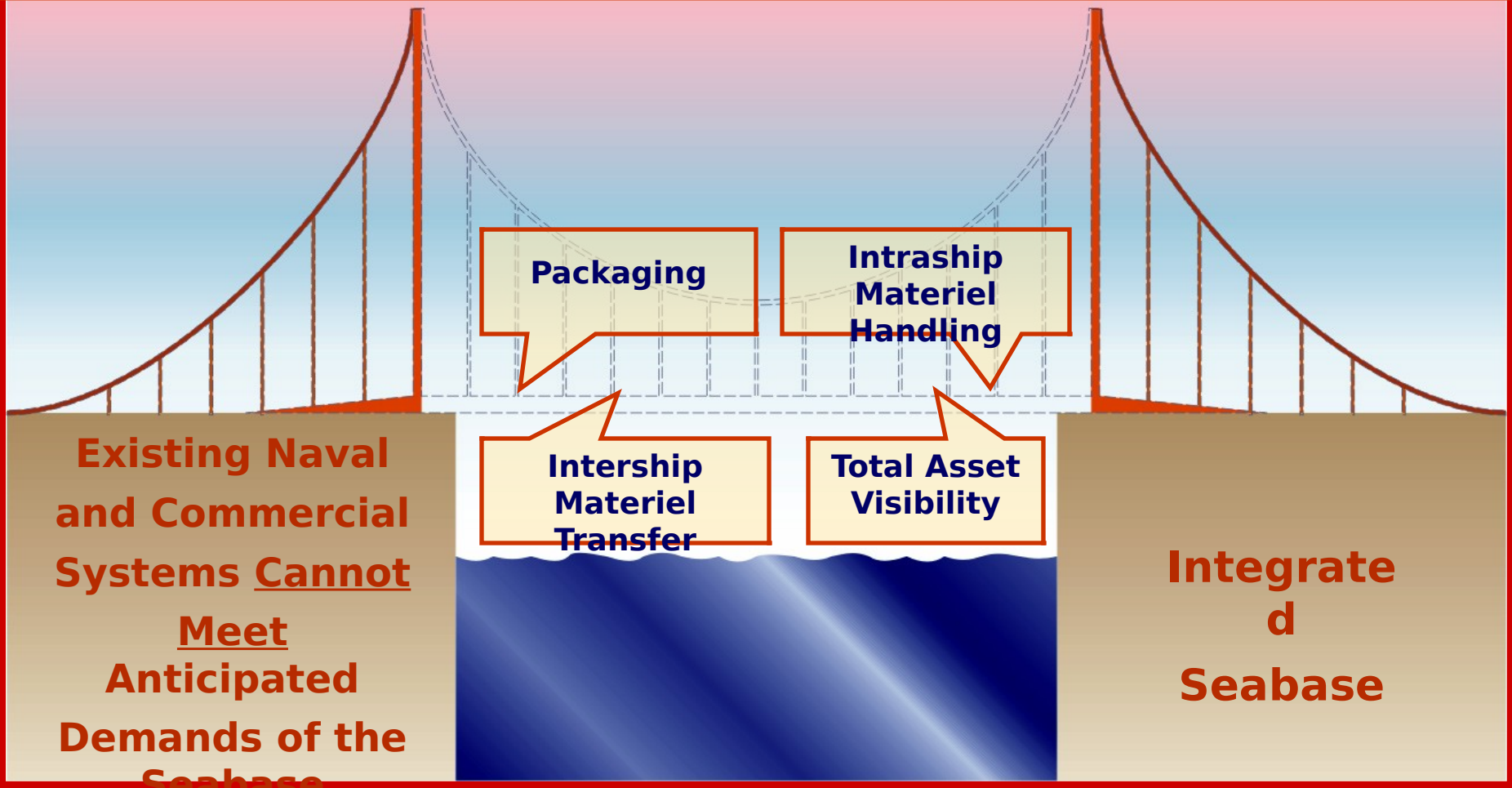
(For Materiel Packaging, Handling, Transfer, and Asset Visibility Systems)

Ships within the Seabase Need an Integrated Capability to Perform ***Operational Logistics Functions*** with More Efficiency, More Flexibility, and without Dependence on Shore Based Infrastructure



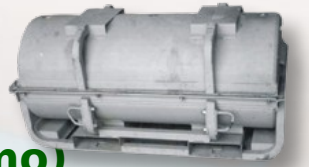
Bridging the Gap

Integrated Solutions for Bridging the Gap Between Current and Desired Seabase Logistics Capabilities Will Require Enabling Technologies and Engineering/Process Improvements


Packaging
Intraship Materiel Handling
Intership Materiel Transfer
Total Asset Visibility
Existing Naval and Commercial Systems Cannot Meet Anticipated Demands of the Seabase
Integrated Seabase

Why Change Packaging?

- **Throughput Requirements Cannot be Met with Break Bulk Operations**
- **Too Many Different Boxes**
- **Inefficient for Retrograde**
- **Boxes Are Segregated by Contents (Ammo)**



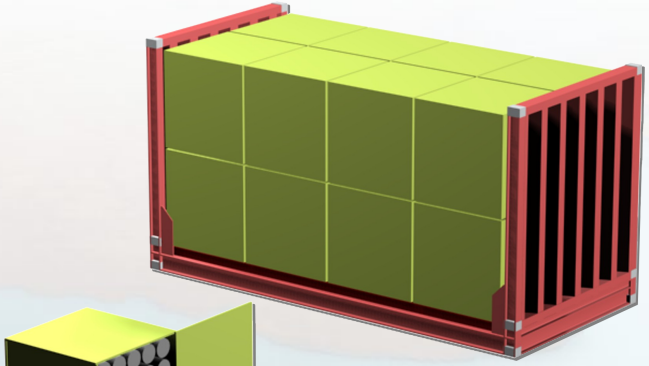
Customized Shapes

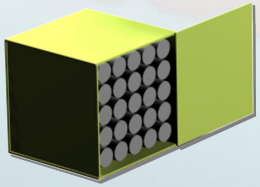
Packaging/Banding Waste

Improvements in the Logistics Pipeline Must Start with Packaging

Desired Capabilities for Packaging

- Modular System Design
- Combat/User Configured Loads
- Rapid Breakout
- Effective Force Reconstitution
- Reduction in Waste
- Efficient Stowage of Incompatible Loads





- Blast Mitigation
- Collapsible Box
- Automation Ready
- Intermodal Compatibility

Advanced Packaging is Needed to Add "Intermodal Capability" and Enhance Break Bulk Capability to Efficiently Meet the Sustainment Requirements of the Seabase

Why Improve IntraShip Materiel Handling?

- **Ship-to-ship Transfer Rate Exceeds Strikedown Rate**
- **Massive Pre-stage Required**
- **Selective Access Requires Significant Maneuver Space/Operations**
- **No Dedicated Handling Paths/Various Choke Points**
- **Multiple Material Handling Equipment (MHE) Handoffs**
- **Manual Stowage/Dunnage Systems**
- **Elevator Load Carrying Capacity Not Fully Utilized**
- **Multiple Single-purpose MHE Types**

Massive Pre-stage

Manual Stowage

Secure for at Sea - Dunnage

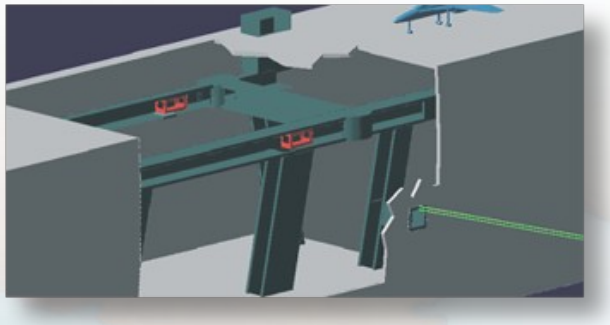
Massive Pre-stage

Handling Transitions

Strikedown & Stowage Systems Are the Leading Contributors to an Unbalanced Logistics Pipeline System

Desired Capabilities for IntraShip Materiel Handling

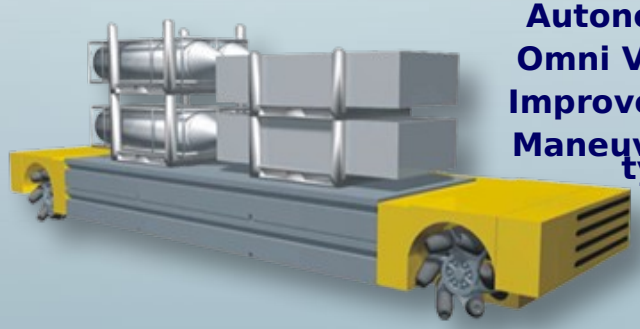
- **Strikeup/Strikedown at the Same Rate as Delivery or Transfer (Balanced System)**
- **Selective Offload and Stowage of Material and Vehicles**
- **Automated Materiel Handling**
- **Automatic Elevator Loading/Unloading**
- **Tailored/User Configured Load Assembly**
- **Intraship ISO Container Handling**
- **Container Stuffing and Unstuffing**



Linear Electric Drive Transport

Multi Platform Ropeless Elevators

ASRS



Autonomous Omni Vehicle Improved MHE Maneuverability

Internal Handling and Stowage Systems Will Need to Meet Significantly Greater Throughput Rates and Selective Offload Capability

Why Change Intership Materiel Transfer?

- **Sea State Limits Ship, Lighterage, and Other Platform Operations**
- **Efficient Transfer of Materiel, Vehicles, and ISO Containers Between Vessels is Needed**
- **Heavy Load Transfer Capability is Inadequate**

Skin to Skin Replenishment
Limited to SS2 at anchor

Vertical Replenishment

Connected Replenishment
Limit: 5,700 lbs SS3

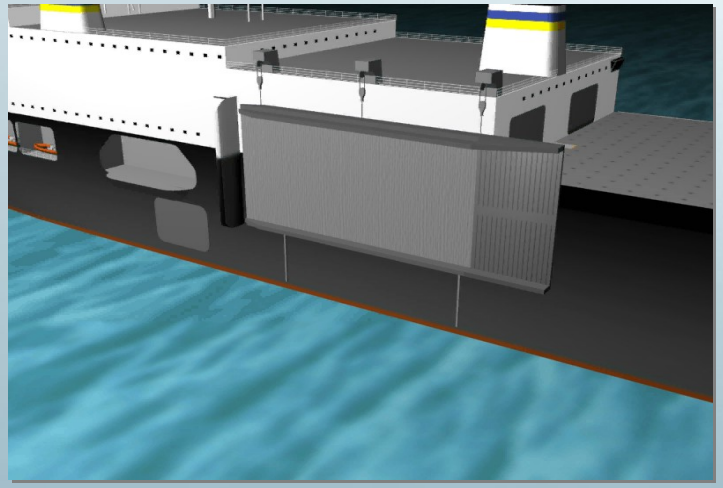
The Evolution of Intership Materiel Transfer is Essential to Support the High Capacity Transfer and Throughput Demands of the Seabase

Desired Capabilities for Intership Materiel Transfer

- **Intermodal/Commercial Interoperability**
- **Increased Sea State Capability**
- **Increased Overall Throughput**
- **Improved Retrograde Transfer Capability**
- **Heavy Transfer Capability**
- **Reduction in Time Alongside**
- **Improved Small Surface Craft**

Motion Compensation Ship Roll Mitigation Advanced Fendering/Mooring

Heavy 12K UNREP: Total Load Control, Station Keeping, Wireless Ranging, Wireless Data Link, Tensioned Ropeway



Ship to Surface Craft Interface

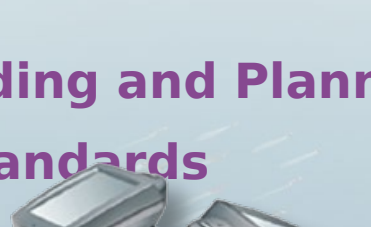
Why is Real Time Total Asset Visibility Required?

- **Current Methods Are:**
  - **Time Consuming, Manual, Paper Based Systems**
  - **Stovepiped Logistics Processes**
  - **More Conducive to Errors or Redundant Accounting**
  - **Not Conducive to Continuous Tracking From Factory to Warfighter**
  - **Not Conducive to the Efficient and Flexible Selective Offload and Reconfiguration of Loads**
  - **Lacking Integration with:**
    - **Materiel Handling & Transfer Systems**
    - **Shipboard Networks**
    - **Logistics Information Systems (NTCSS)**
    - **Cargo Loading and Planning Tools**

Requires Integration of Tools and Processes That Are Technically Achievable Today

Desired Capabilities for Total Asset Visibility

- **Automation of Supply Chain Information Systems**
- **Real Time Data Provided to:**
  - Naval Tactical Command Support System (Existing)
  - Enterprise Resource Planning (Future)
- **Integration with Automated Materiel Handling Systems**
- **Automated Cargo Loading and Planni**
- **Open, Scalable and Standards Based Architecture**



RFDC
RFID
Smart Shelves
Sensor Tags

Real Time Total Asset Visibility is Required to Manage High Volume/High Tempo Movement of Materiel

Contact Information

- PMS 325 Sealift R&D Program Manager, Terry Shen, 202-781-0851
- N42 NavOpLog Integration Program Manager, Tim Barnard, 202-781-2315
- Visit ONR FNC Website at www.onr.navy.mil/explog/default.asp
- Or Contact NSWC Team Members:

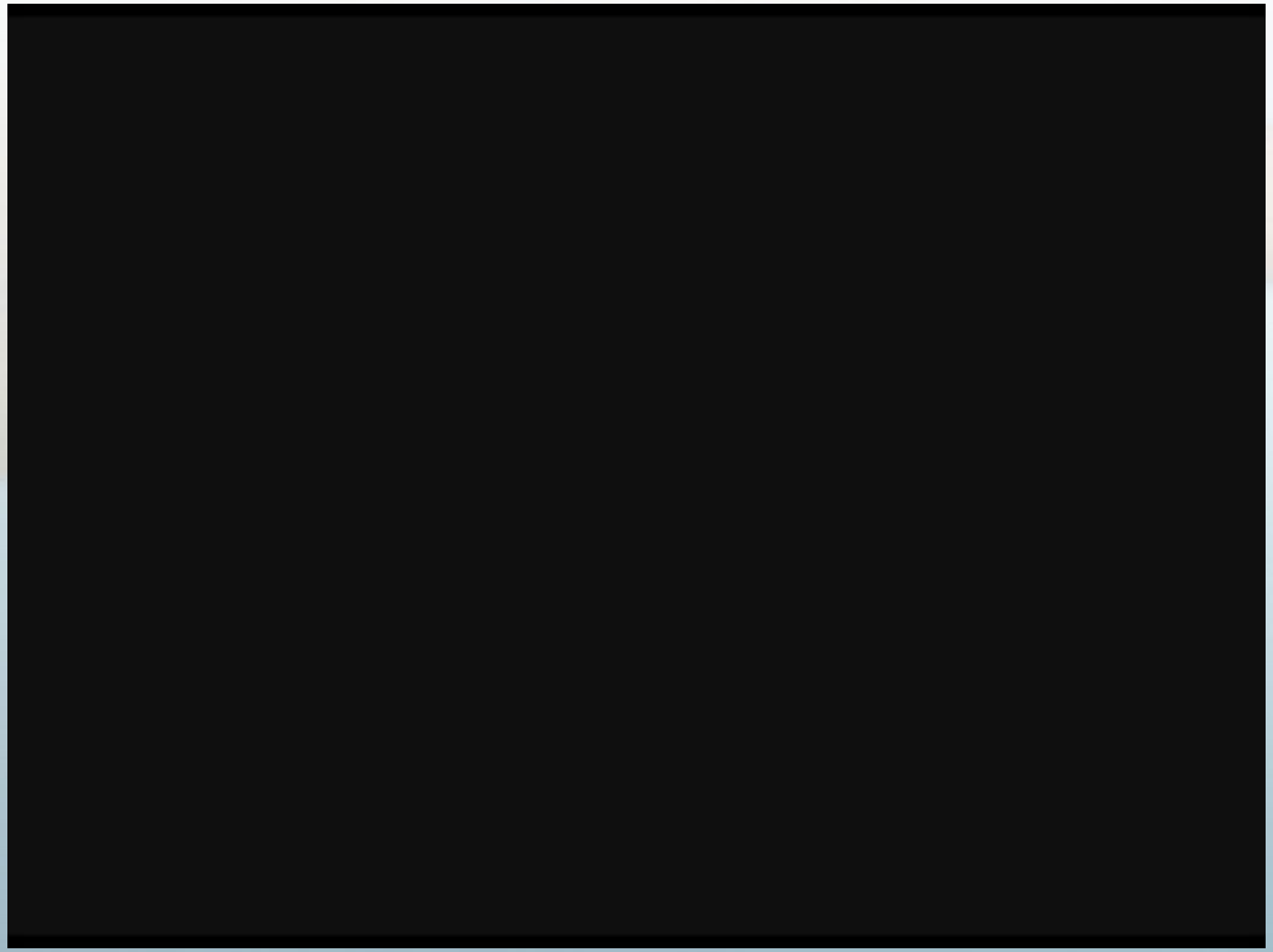
Organization	Name	Phone	E-mail
NSWCCD-SSES	Stephen M. Michetti **	215-897-7369	michettism@nswccd.navy.mil
NSWCCD-SSES	Lionel Castonguay	215-897-7546	castonguayLJ @nswccd.navy.mil
NSWCIH-PHST	Nick Lakin	732-866-2843	lakinnr@phst.navy.mil
NSWCCD	Art Rausch	301-227-4590	rauschAB@nswccd.navy.mil
NSWCCD	J ason Strickland	301-227-3855	stricklandJ D@nswccd.navy.mil
NSWCPHD-UNREP	George Lyon	805-228-7998	lyonGH@phdnswc.navy.mil
NSWCDL-CSS	Laura Thompson	850-235-5435	thompsonLH@ncsc.navy.mil
** Team Lead			

Glossary

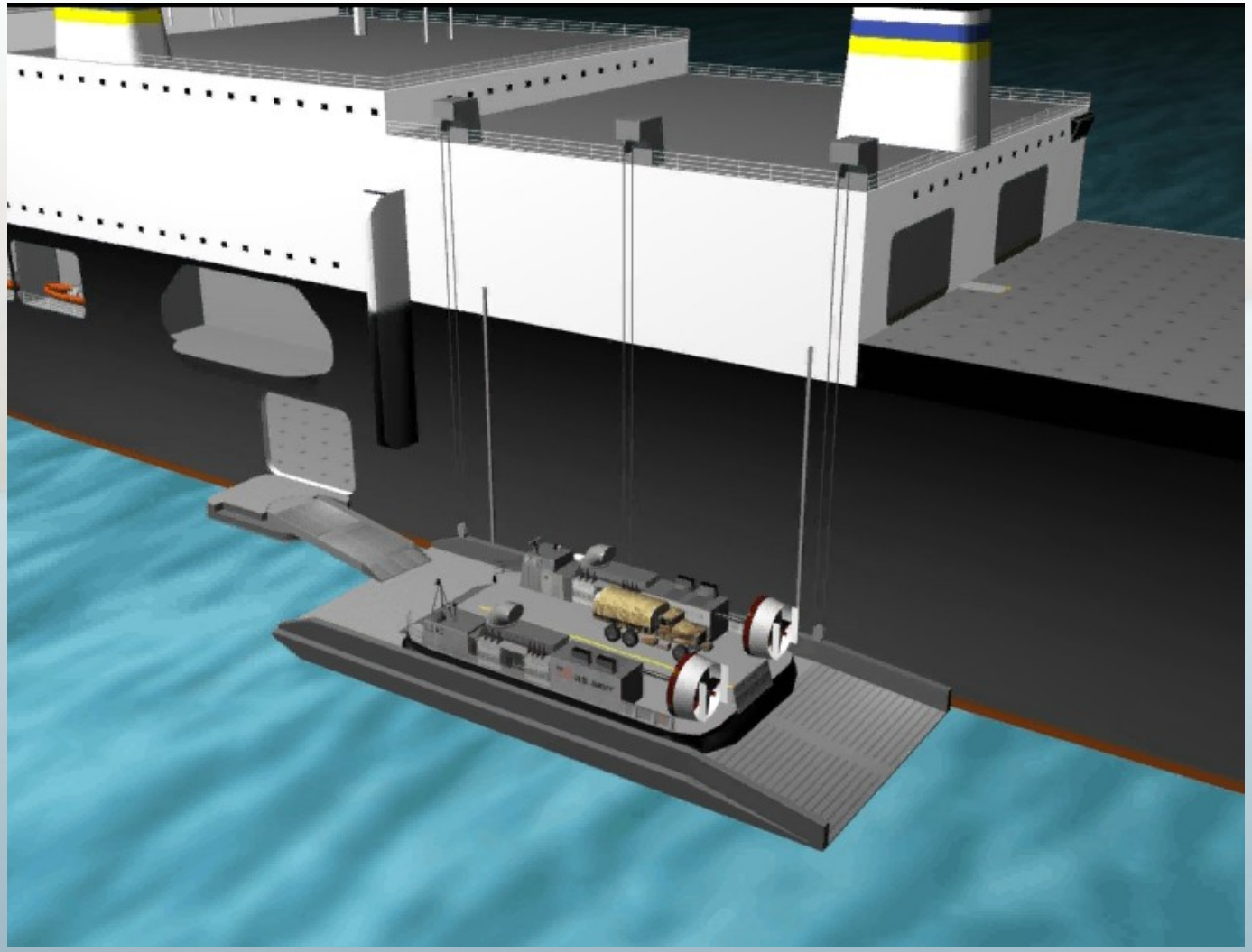
JILWG	**Joint Intermodal Logistics Working Group**
AIT SG	**Automatic Identification Tracking Steering Group**
NavOpLog	**Naval Operational Logistics**
APM	**Acquisition Program Manager**
SDM	**Ship Design Manager**
MHE	**Material Handling Equipment**
PHST	**Packaging, Handling, Stowage and Transportation**
NTCSS	**Naval Tactical Command Support System**
FNC	**Future Naval Capabilities**

Skin to Skin

UNREP



Ship to Surface Craft Interface



Ship to Surface Craft Interface